

ADIF

The Right Strategic Partner for California High Speed Rail



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Chief Strategic Officer



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- **General Framework**
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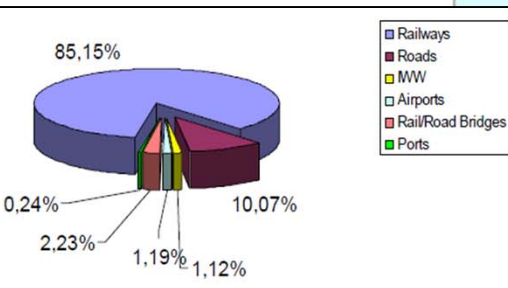
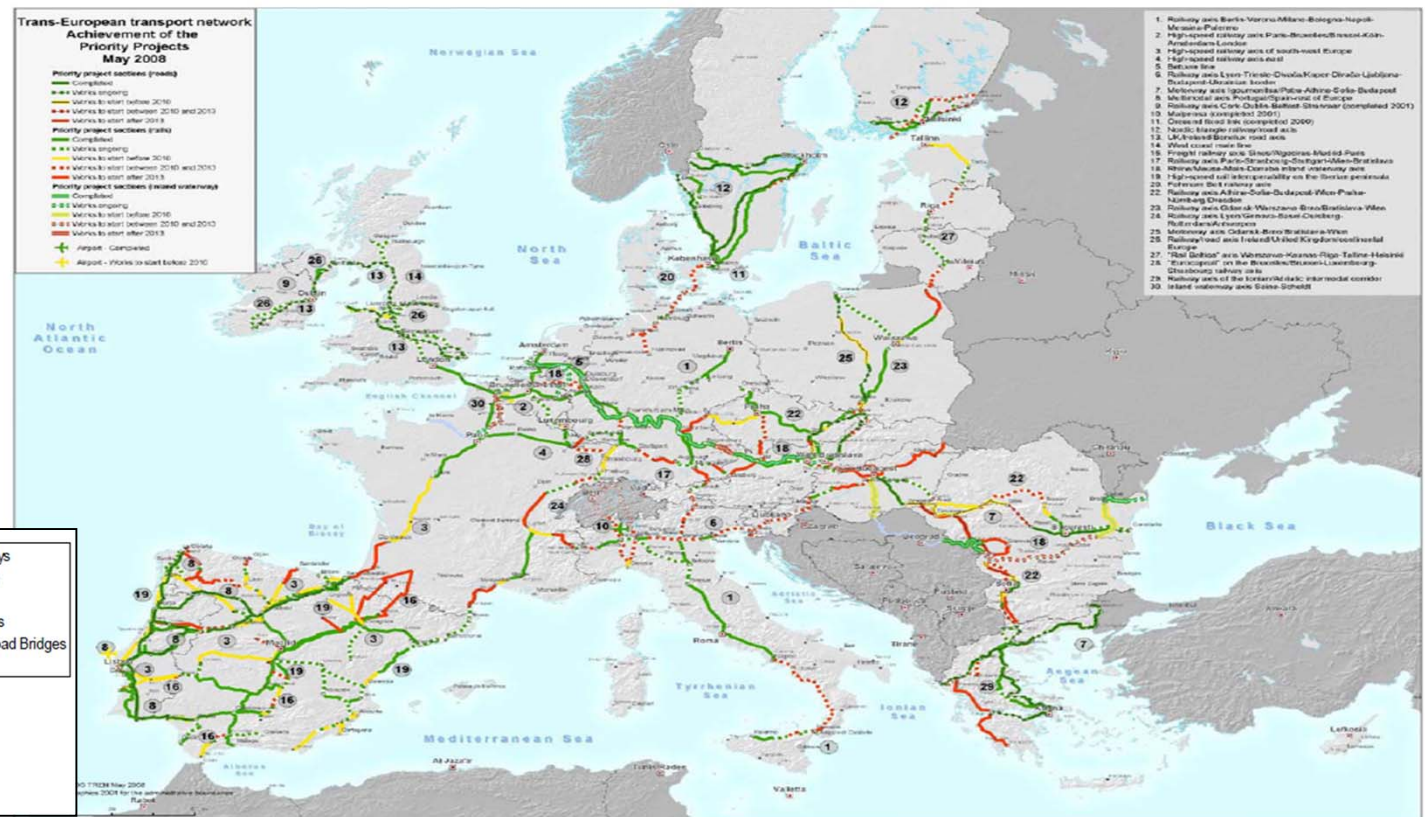
General Framework

- Developed societies need a **growing transport system**
- Response must balance **development and sustainability**
- **Rail transport** is one of the **keys to the future**

General Framework – EU Commitment

Trans-European Network of Transportation > TEN-T

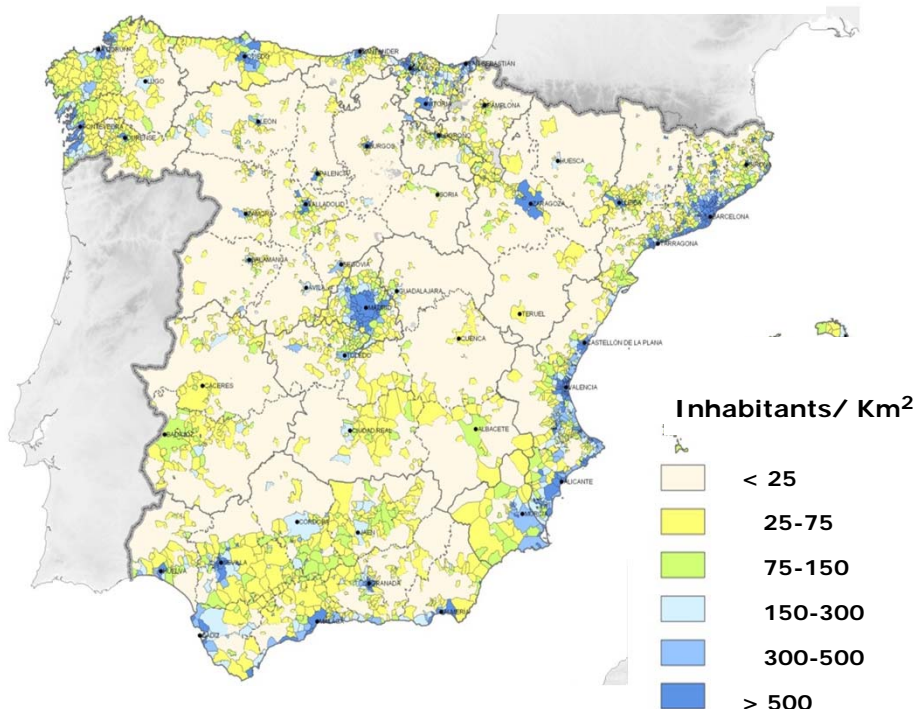
- 18 railway projects (85.2 % of total budget)
- 3 mixed projects (motorway-railway)
- 2 inland waterway projects
- 1 motorway-of-the-sea project



General Framework - Spanish Features

- Population distribution in mainland Spain is optimal for transport network « hub & spoke »
- Average stage length center-periphery (550 km /340 miles) is optimal for HST

Population Density



HSL Corridors



Spain:
195,364 sq miles

California:
163,696 sq miles

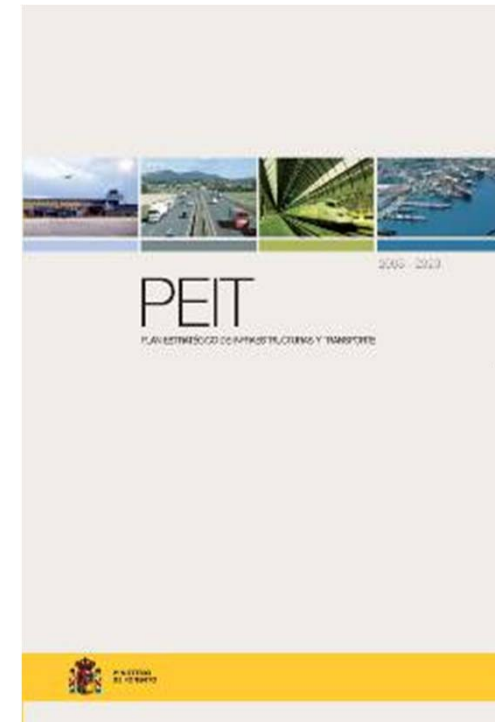
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Transportation Policy in Spain

2005-2020 Strategic Plan for Transportation Infrastructure

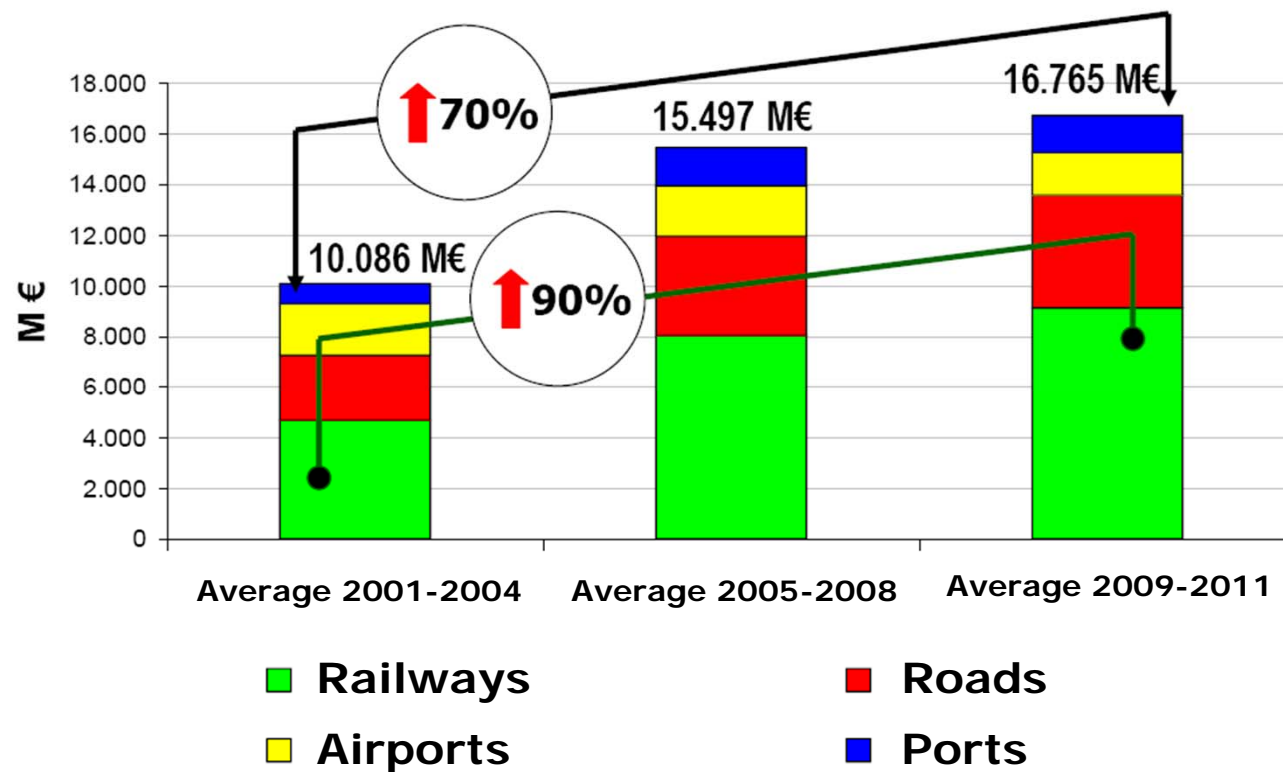
- Instrument for the **development** of an efficient transport network
- **Planning** reference
- Development of the **new transport model**
- **Structuring** the territory
- Increase of rail transport **opportunities**
- **Total Budget of 250 B€**

**48.5% of investment budget
is for railway infrastructure**



Transportation Policy in Spain

Public investments by transportation mode



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Railway Policy in Spain

■ 2005-2020 Strategic Plan for Transportation Infrastructure

- 120,000 M€ in railway investment
- High Speed network
- Development of a Charge-for-Use transport system

■ Multi-annual Contract ADIF-Government 2007-2010 / 2011-2014

- To ensure the funding of its activities
- Commitment for improving the Government's network
- Drawing up a new Multi-annual Contract

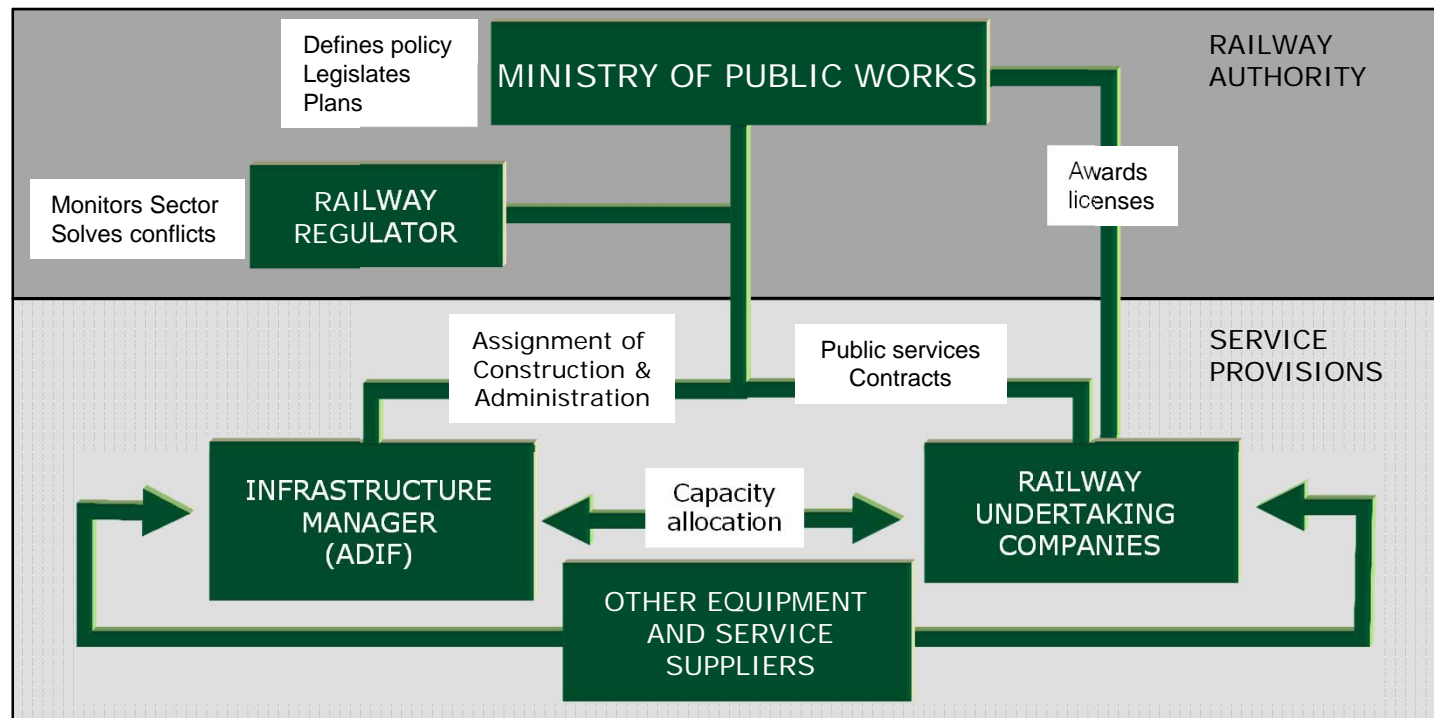
■ Extraordinary Infrastructure Plan

- Public-private PPP collaboration Plan
- 17,000 M€ for the next two years
- ADIF: 10,000 M€

Railway Policy in Spain

New legal framework. Railway Industry Act 39/2003

- Infrastructure management and transport operation unbundling
- Opening of the freight railway market to competition



Railway Policy in Spain

Basic Commercial Model

- **ADIF** (infrastructure manager) sells **train paths** to rail undertakings
- **Rail undertakings** (Renfe & others) sell **travel tickets** to passengers and freight capacity to companies

Subsidy Policy

→ **ADIF:**

In **Conventional Network**, commercial incomes (train paths) cover:
~10% of maintenance and operations costs (~**90%** financed by Contract with Government)

In **High Speed Network**, commercial incomes (tickets) cover:
100% of maintenance and operations costs (**0%** subsidy)

→ **Undertakings:**

0% subsidies for freight and long distance traffics (including **High Speed**)
Only urban traffics are subsidized by Governments and Regional entities

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ADIF – General Strategic Goals

- To contribute to sustainable development
- To guarantee railway safety
- To increase global efficiency of railroad system
- To improve territory integration and social cohesion
- To rise the quality of life of the citizens



ADIF – Main Activities

- Construction of new railway lines
- Maintenance and renewal of railway network
- Management of traffic operations
- Capacity allocation to railway undertakings
- Management of passenger stations and freight terminals
- Development and management of optical fiber network



ADIF – Capital Structure

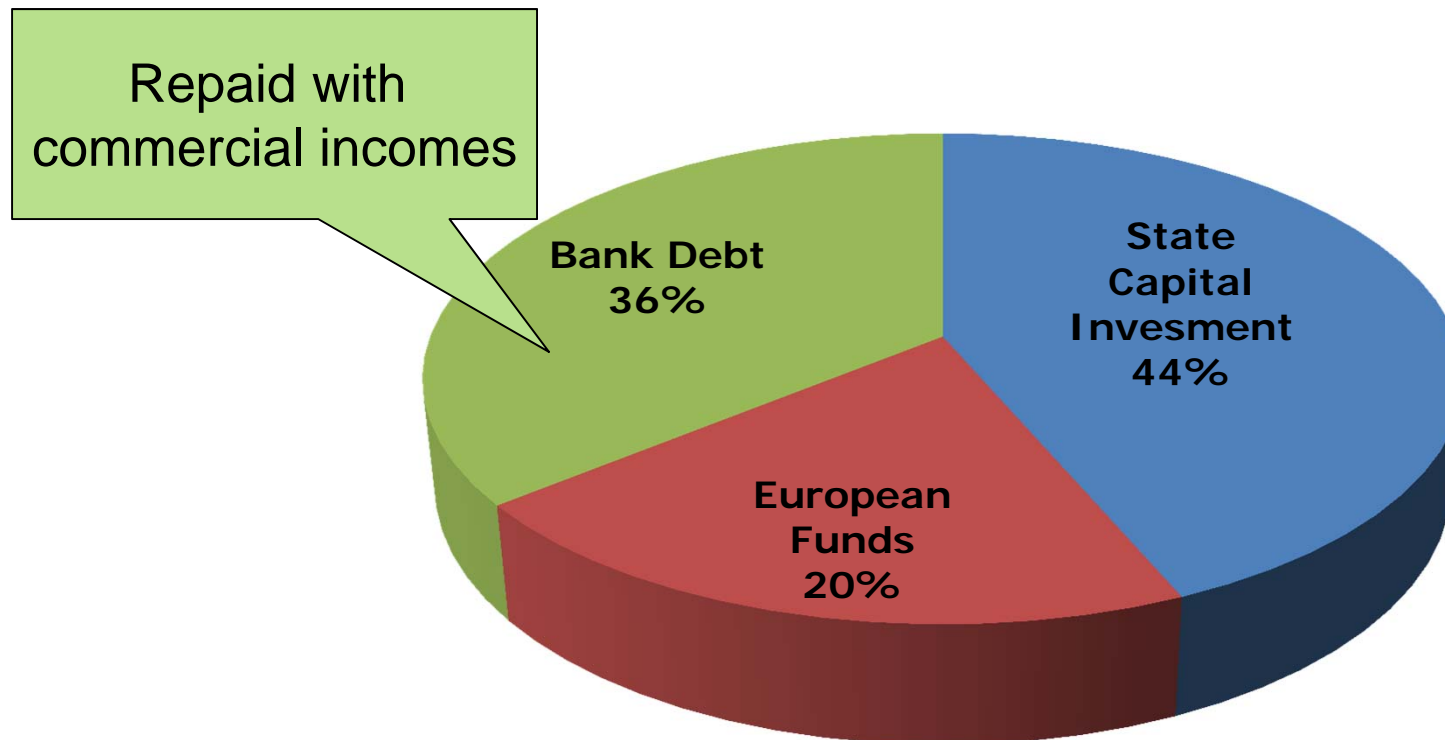
▪ Investments (1 st investor in Spain)	28,478 M€ (2005-2011)
High Speed:	23,546 M€
Conventional Network:	4,932 M€
▪ Fixed Assets ⁽¹⁾	32,398 M€
▪ Own Resources ⁽¹⁾	15,317 M€

⁽¹⁾ 31/03/2011



ADIF – Funding Structure

ADIF uses three funding sources for infrastructure construction



ADIF – Main Assets

High Speed Rail Network _____ 2,776 km

- ADIF's asset
- Once constructed, there is no subsidies for maintenance neither operations.

Conventional Rail Network _____ 11,096 km

- State's asset
- Maintained and operated with public funds (Multi-annual Contract ADIF-State)

Optical Fiber Network _____ 16,130 km

- ADIF's asset (2009 revenues: 67M€)
- Commercial business + Telecom internal service

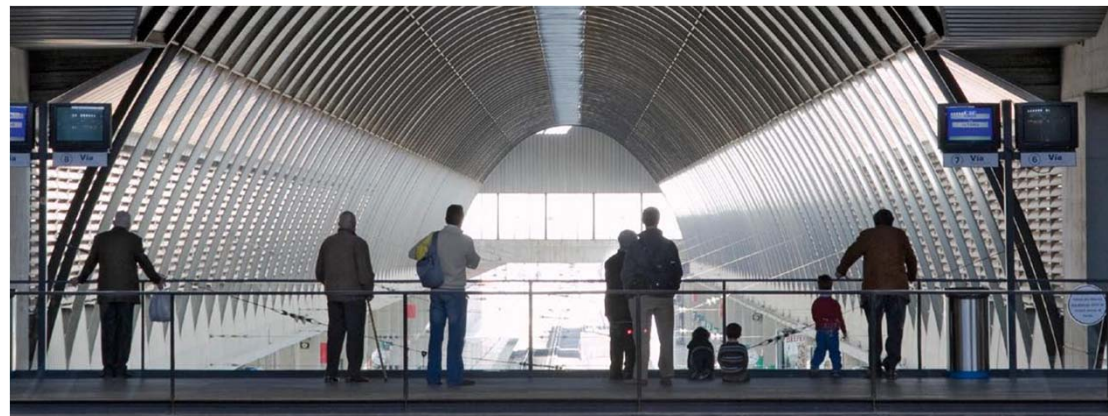
Other ADIF's asset: Stations _____ 1,568

Freight Yards _____ 86



ADIF – Activity Figures in 2010

- **Passengers at stations**_____772 M (Atocha Station: 0.5M day)
- **Number of trains** _____1.8 M trains
 - High Speed_____54,755 trains (150 daily mean)
 - Other Long Distance_____96,722 trains (265 daily mean)
 - Urban_____1,207,420 trains (3,300 daily mean)
 - Interurban_____269,723 trains (740 daily mean)
 - Freight_____123,822 trains (340 daily mean)



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High Speed lines in Europe

COUNTRY	IN SERVICE	UNDER PROJECT/ CONSTRUCTION	PLANNED
SPAIN (ADIF)	2,776*	2,120	243
FRANCE	1,872	299	2,616
GERMANY	1,285	378	670
ITALY	876	-	395
BELGIUM	209	-	-
UNITED KINGDOM	113	-	-
SWITZERLAND	35	72	-
NETHERLANDS	120	-	-
PORTUGAL	-	-	1,006
SWEDEN	-	-	750
POLAND	-	-	712
RUSSIA	-	-	660
TOTAL	7,286	2,869	7,052

* Including 641 km of HSL with broad gauge (newly constructed) and 20 km in Spain by TP Ferro as concessionary

2010 SITUATION

HSL in Europe 7,286 km
HSL in the world 12,551 km

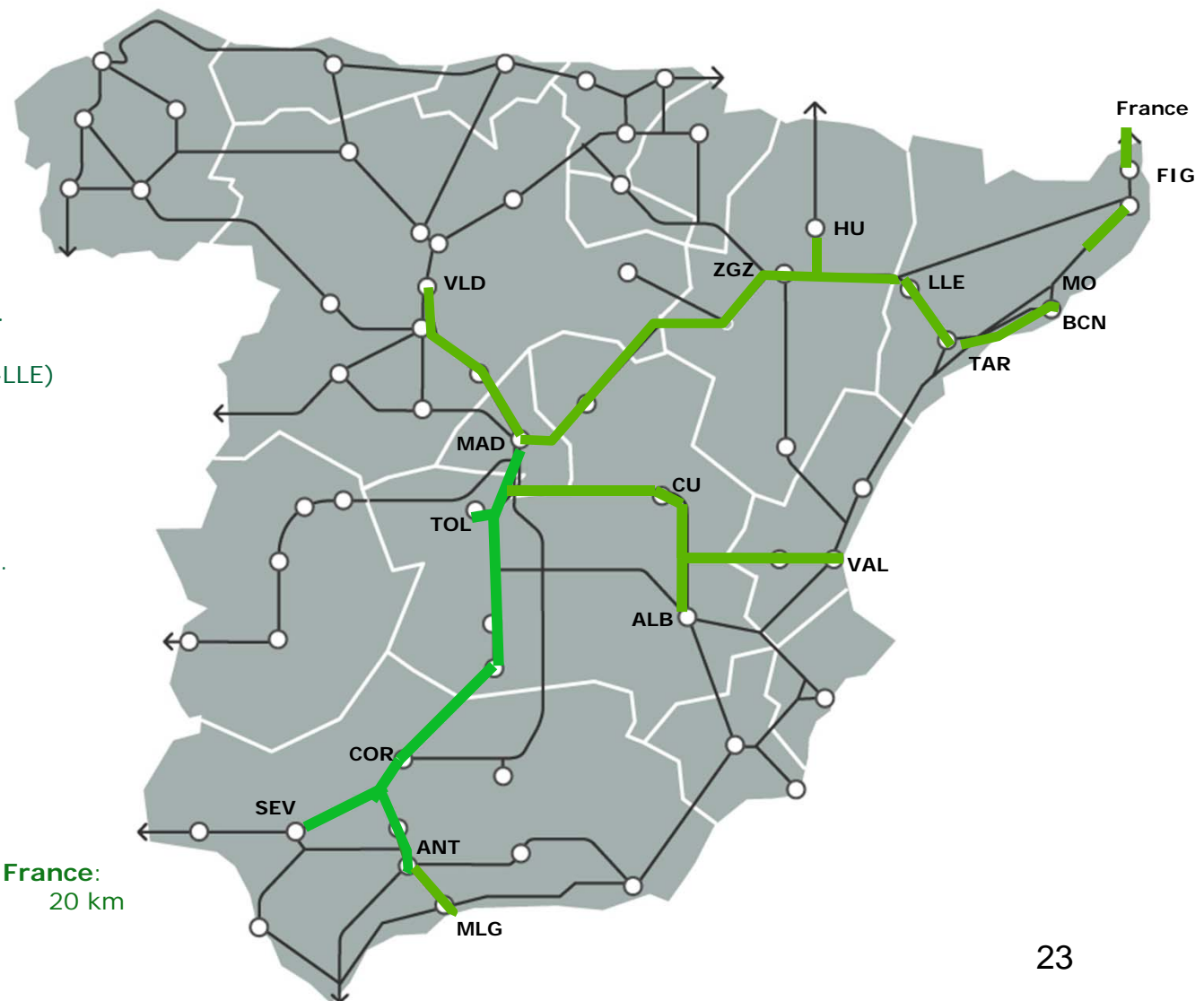


2015 FORECAST

HSL in Europe 10,407 km

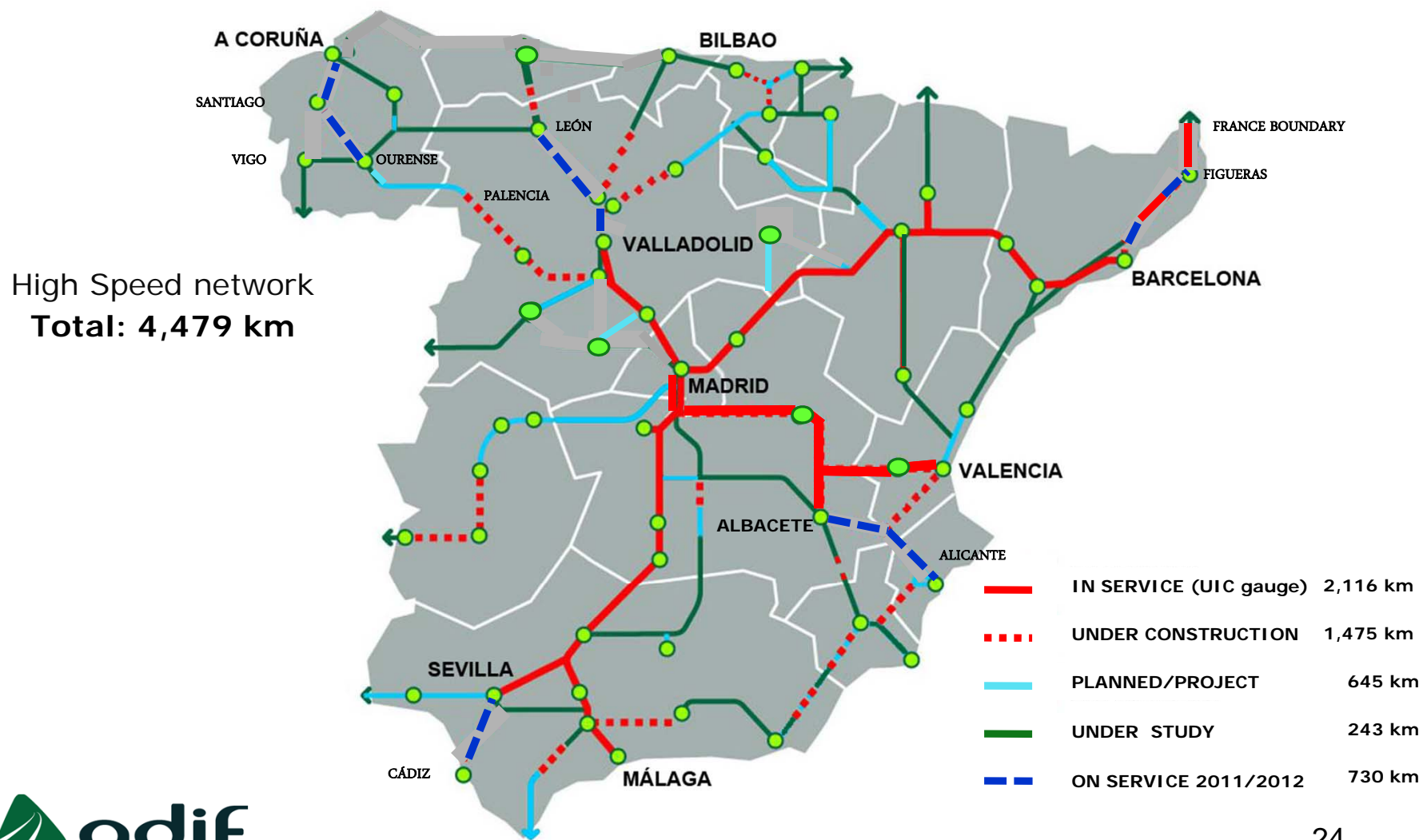
High Speed Network in Spain– Landmarks

- 1992 - **Madrid-Sevilla:** 471 km
(MAD-SEV)
- 2003 - **Madrid-Lleida:** 468 km
(200 km/h ASFA).
(MAD-LLE)
Zaragoza-Huesca: 79 km
(ZGZ-HU)
- 2006 - **Lleida-Tarragona:** 95 km.
(LLE-TAR) / (COR-ANT) / TOL
Córdoba-Antequera: 100 km.
Toledo connection: 21 km.
- 2007 - **Madrid-Lleida:** 468 km (MAD-LLE)
(300 km/h since May 2007)
Madrid-Valladolid: 181 km.
(MAD-VLD)
Antequera-Málaga: 55 km.
(ANT-MLG)
- 2008 - **Tarragona-Barcelona:** 88 km.
(TAR-BCN)
- 2010 - **Madrid-Cuenca:** 183 km.
(MAD-CU)
Madrid-Albacete: 315 km.
(MAD-ALB)
Madrid-Valencia: 391 km
(MAD-VAL)
Mollet – Figueres: 75 km
(MO-FIG)
International Connection to France:
20 km

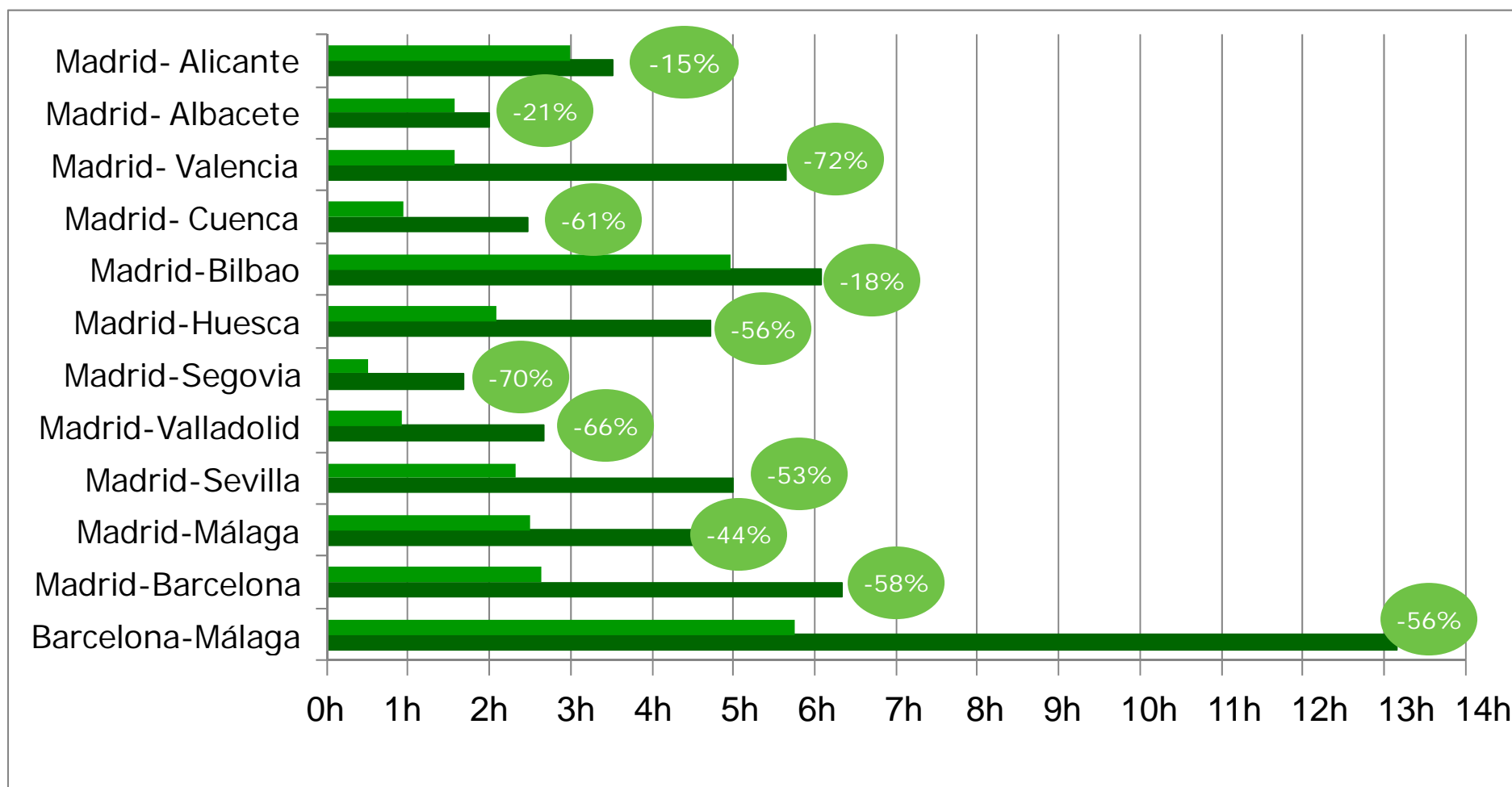


High Speed Network in Spain – Current situation

Forecast 2011/2012



High Speed Network in Spain-Travel time reduction



High Speed Network in Spain-Operation Excellence

- 24 Cities connected by High Speed lines (44 with double gauge trains)
- Punctuality (99.6%) with total refund if 5' delay
- Flexibility ticketing
- High Comfort Standards
- Safety (0 accidents)

307
HS trains
per day

111,500
HS seats
per day

Customer Satisfaction

First HSL

95% after 19 years of operation

New HSL

96% after the 1st year of operation

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Building a new HSL – Example

High speed objective → Saving time



Building a new HSL – Planning Questions

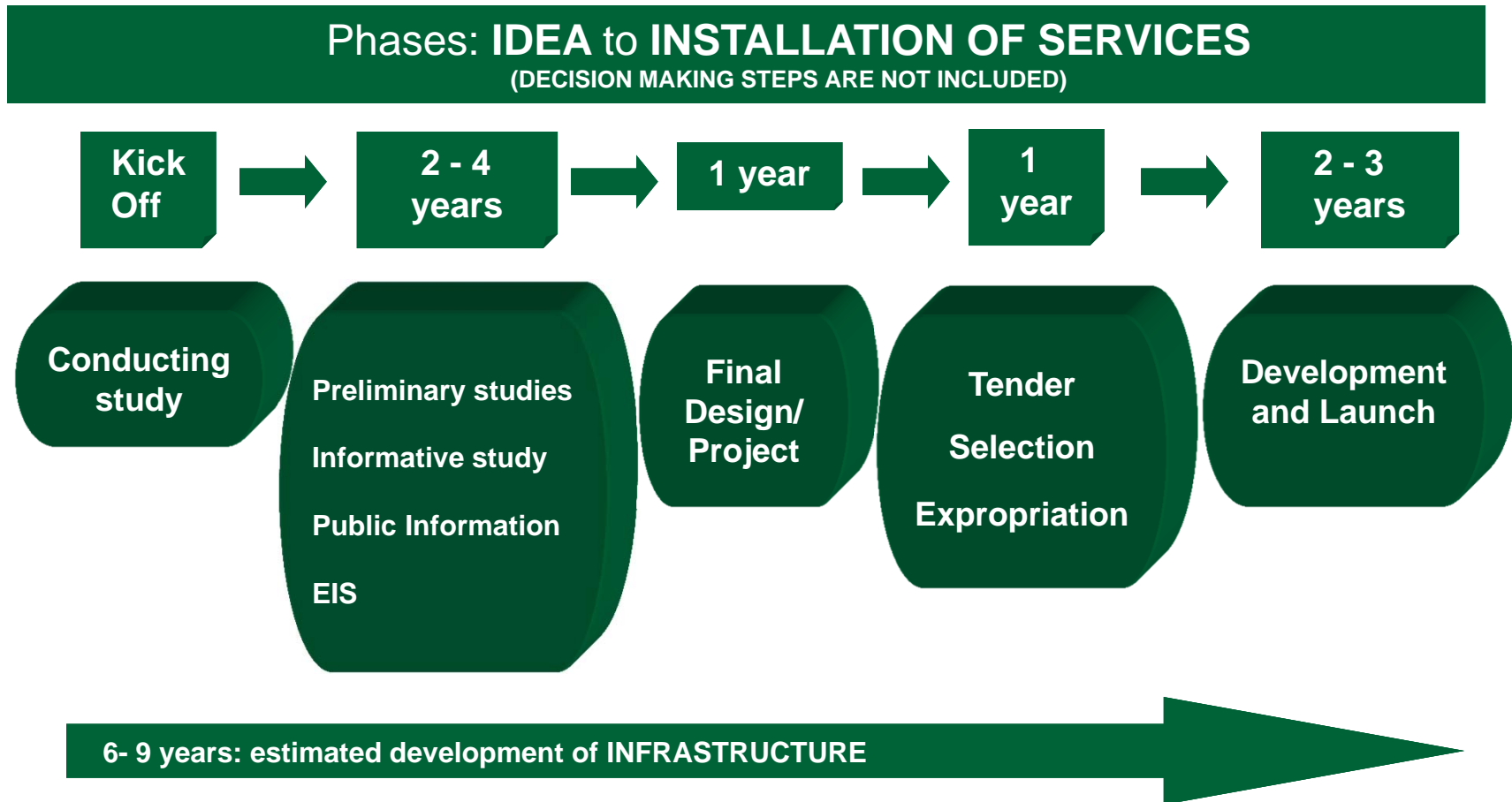


- High speed line or upgrade existing lines?
- Passengers or mixed freight/passengers?
- What insertion in regional development?
- Which cities to serve?
- How to complement other networks?
- What is the environmental impact?

Building a new HSL – Stakeholders



Building a new HSL – Usual Steps & Timing



A practical case: Madrid-Valencia/Albacete New HSL (438 km): 7 years

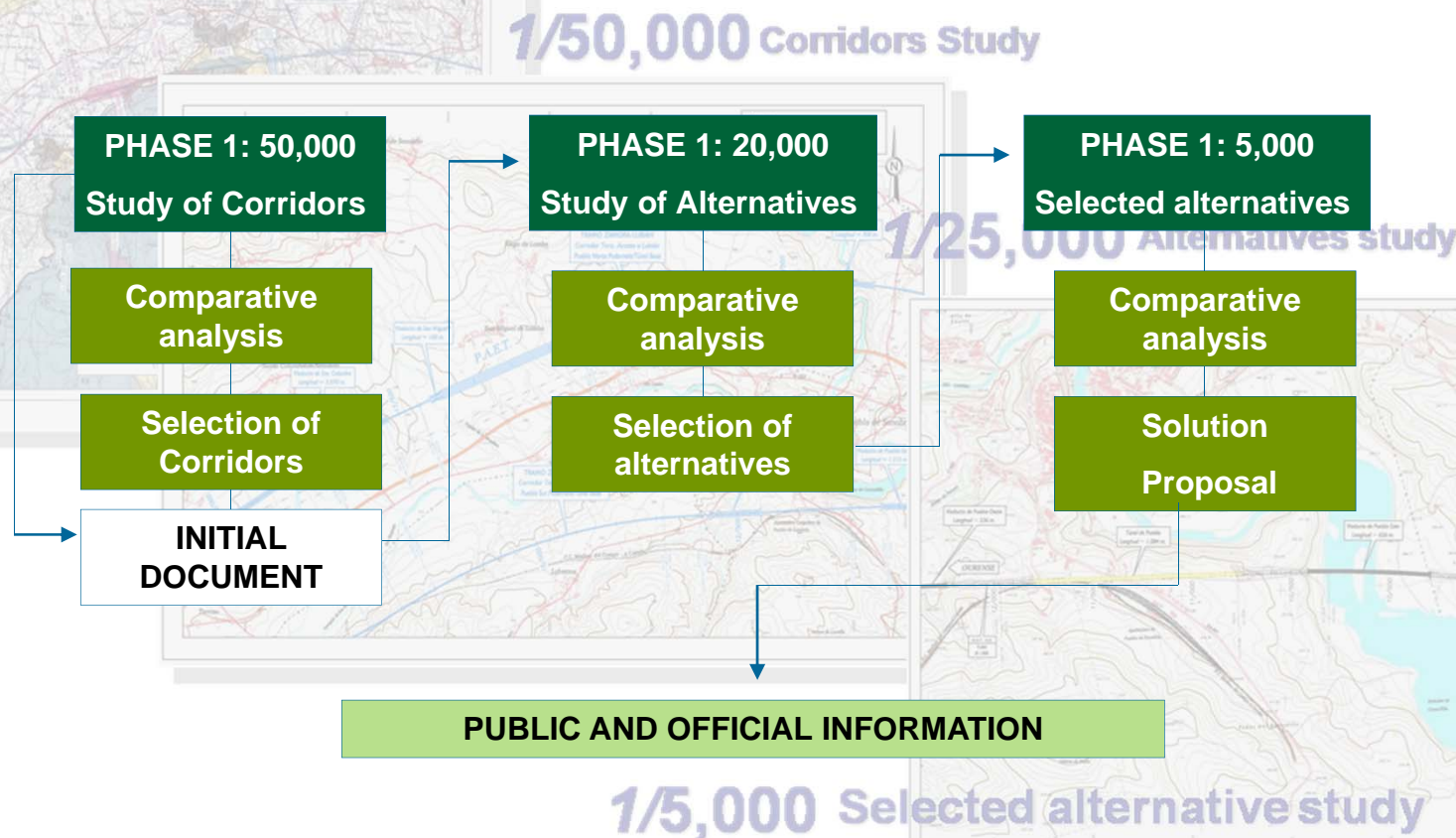
Building a new HSL – Preliminary studies

- Influence analysis of the new line
- Accessibility studies
- Traffic analysis
- Technical and economic viability



Building a new HSL – Informative Study

Summary of Procedures



Historic Final Cost Deviation: 2x Estimated Cost (1:5,000 project)
1.05x Estimated Cost (1:1,000 project)

Building a new HSL – Environmental approval

INFORMATIVE STUDY

PUBLIC AND OFFICIAL INFORMATION

PUBLIC COMMENTS



Analysis and Response
to Comments

Application for the
Environmental Impact
Statement (EIS)

Publication of the
Environmental Impact
Statement

Definitive approval of
the Informative Study

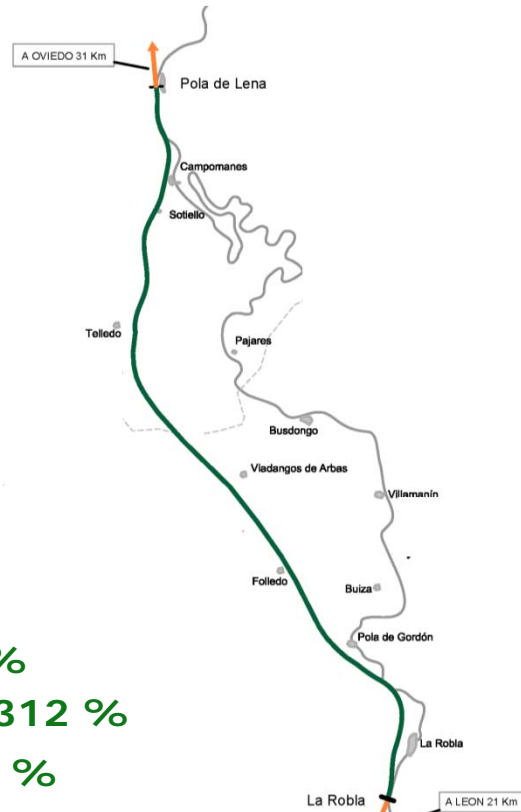


CONSTRUCTION PROJECT (1:1000) CAN START

Building a new HSL – Other Examples

HISTORIC LINE

(since 1884)
LENGTH: 83 km
SPEED: 70-80 km/h
JOURNEY TIME: 55'
BIGGEST TUNNEL:
LA PERRUCA (3,071 m)



NEW HS LINE

(under construction)
LENGTH: 49 km ▼ 33 %
SPEED: 250 km/h ▲ 312 %
JOURNEY TIME: 15' ▼ 73 %
BIGGEST TUNNEL:
PAJARES (25 km)

Cantabrian Range Crossing
(Puerto de Pajares)

VALLADOLID

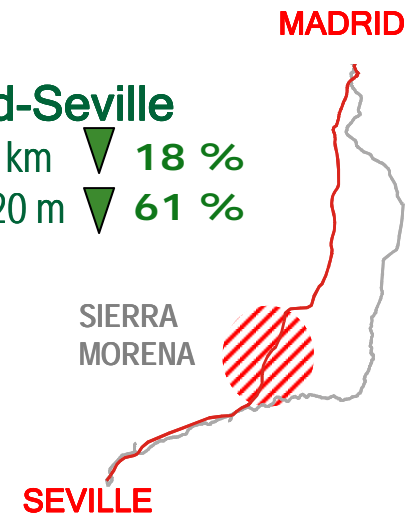
HSL Madrid-Valladolid

250 km → 180 km ▼ 28 %
 2h 20m → 0h 50m ▼ 71 %



HSL Madrid-Seville

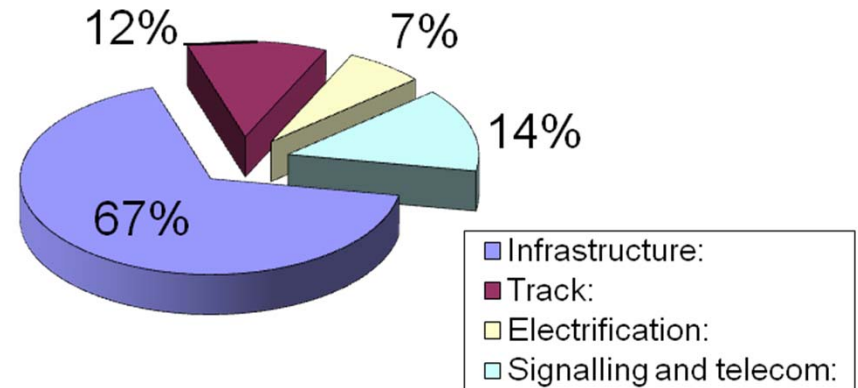
570 km → 470 km ▼ 18 %
 6h 00m → 2h 20 m ▼ 61 %



Building a new HSL – Standard Costs

■ Real costs in Spanish HSL :

- ✓ Infrastructure: 5 – 15 M €/km
- ✓ Track: 1.7 – 2.0 M €/km
- ✓ Electrification: 0.8 – 1.3 M €/km
- ✓ Signalling and telecom: 1.1 – 3.3 M €/km
- ✓ Total Cost: 9.4 – 20.9 M €/km



■ Unit Cost for large and medium-sized stations

- ✓ Medium-sized 15 -50 M €
- ✓ Large 50-200 M €



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ADIF Tech – Track

At the cutting-hedge of track technology and engineering

- Three rail track for broad and standard gauge
- Switches: at speed of 350 km/h over switches crossed at 220 km/h in deviations
- 2 km/day alignment over ballast achieved



ADIF Tech – Electrification

At the forefront of overhead catenary systems, power equipment and electrical engineering

- Catenary EAC-350: 100% Spanish design specific for 350 km/h. Interoperability certification
- Power telecontrol system integrated in CRC



ADIF Tech – Signalling/ERTMS

- Set up in 1,491 km of HSL (48% of the total km in Europe)
- Madrid- Sevilla HSL runs with LZB system
- Madrid- Barcelona HSL is pioneer in using ERTMS:
 - ✓ March 2006: speed increase from 125 to 160 mph
 - ✓ October 2006: speed increase to 175 mph
 - ✓ May 2007: speed increase to 187 mph
 - ✓ ERTMS level 2, speed increase to 220 mph
- Córdoba- Málaga, Madrid- Valladolid and Madrid-Valencia use ERTMS
- Soon deployed in every HSL under construction and Madrid-Sevilla HSL

**5 years of
experience in rail
Interoperability**

ADIF Tech – DaVinci system

System designed for the management of HSL

- Integration of all subsystems allowing centralized real time operation
 - ✓ Centralized Train Control CTC
 - ✓ ERMTS central post
 - ✓ Energy Supply
 - ✓ Fixed and mobile communications
 - ✓ Auxiliary supervision systems
 - ✓ Video surveillance
- In addition includes the following environments.
 - ✓ Simulation and Training
 - ✓ Integrated reconstruction of events
 - ✓ Validation and testing environments



DaVinci clients

- London Underground
- ADIF HSL
- FEVE lines
- Morocco network
- Lithuanian railways

ADIF Tech – Detector Systems

Equipment developed by the Spanish industry

- Obstruction detectors
- Hot box detectors
- Weather stations
- Wind monitoring systems
- Track impact detectors
- Gauge detectors



ADIF Tech – Stations

2005-2010 HS Stations

NEW

- ✓ Antequera Santa Ana
- ✓ Camp de Tarragona
- ✓ Málaga María Zambrano (VIALIA)
- ✓ Puente Genil Herrera
- ✓ Segovia Guiomar
- ✓ Cuenca Fernando Zóbel
- ✓ Albacete Los Llanos (VIALIA)
- ✓ Requena - Utiel
- ✓ Valencia Joaquín Sorolla
- ✓ Figueres-Vilafant

REFURBISHED

- ✓ Barcelona Sants
- ✓ Madrid Chamartín
- ✓ Toledo
- ✓ Valladolid
- ✓ Madrid Puerta de Atocha



ADIF Tech – Highlights

- **Tunnels:** Guadarrama (28km, 5th worldwide longest); Pajares (25km, 6th world speed record in drilling with TBM at 90 meters/day)
- **Viaducts:** world record span using the launched deck method
- **Track:** world record max speed (250 mph) in a commercial service sector
- **Switches:** designed for 220 mph speed, to be crossed at 140 mph
- **Overhead catenary:** own HS design for 220 mph (+ 10%)
- **Substations:** own design for 2 x 25 kV system
- **DAVINCI:** Integrated traffic control and management system
- **ERTMS:** At the vanguard of European interoperable system
- **Maintenance:** own laboratory and track examination technology
- **Track gauge exchangers** for standard and broad gauge (1,435 vs 1,668 mm)
- **Longest HSL in operation:** 1,121 km Barcelona-Málaga HSL
- **Punctuality:** World leader with 99,6% of train arrived with less than 3'
- **Lower average costs in Europe**

ADIF – The Right Strategic Partner for CAHSR

- **COST EFFECTIVENESS** due to a philosophy that increases supplier competition
- **RELIABILITY** thanks to our 25 years experience
- **HIGHER RETURN ON INVESTMENT** as a result of our lower costs
- **SHORTER PAYBACK PERIOD** due to our higher performance rates during construction
- **HIGHEST SAFETY AND QUALITY STANDARDS** as our business vision



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